



A.D. 1876, 27th MARCH. N° 1311.

Brewing.

LETTERS PATENT to William Garton, of the Town and County of Southampton, Brewer, for the Invention of "IMPROVEMENTS IN BREWING, AND THE PREPARATION OF A MATERIAL TO BE EMPLOYED THEREIN."

Sealed the 23rd May 1876, and dated the 27th March 1876.

PROVISIONAL SPECIFICATION left by the said William Garton at the Office of the Commissioners of Patents on the 27th March 1876.

WILLIAM GARTON, of the Town and County of Southampton, Brewer. "IMPROVEMENTS IN BREWING, AND THE PREPARATION OF A MATERIAL TO BE EMPLOYED THEREIN."

It has been usual for some time past to employ as a substitute for a portion of the malt used in the brewing of beer a prepared sugar known in the trade as saccharum.

This saccharum is chiefly manufactured from cane sugar by the well known processes of ~~inverting~~ with an acid at certain temperatures; but in consequence of its highly vinous and fermentable character, and the absence of dextrine, the malt used in conjunction with it has to be manipulated in such a way as to retain a larger proportion of dextrine than is usually left by the ordinary methods of brewing, and difficulties arise in effecting this result in some breweries, and the beer produced has in some cases too sweet a flavour, and in others it attenuates too freely.

The article is also manufactured partly from amylaceous substances and partly from cane sugar by a combined process, that is, acid is employed to convert the starch to dextrine-dextrose, when the temperature is reduced and cane sugar added to the acid solution, and as it is necessary to defer the neutralization for several hours to insure a proper inversion of the cane sugar, a further conversion of the rice product takes place and the dextrine cannot be kept intact, consequently this combined process only supplies an inappreciable amount of dextrine to the dextrose and invert sugar produced, therefore almost the same results as those above named are caused.

Sometimes ordinary glucose is mixed with invert sugar in brewing, but owing to the small quantity of dextrine it contains the objection before referred to is not overcome, and although the mixture gives a heavier final gravity to the beer this is due to the presence of inert bodies, which impart an undesirable bitter flavor.

[Price 4d.]

Garton's Improvements in Brewing.

Now my Invention consists in the employment in brewing of what I term dextrine-dextro-lævulose, or dextro-saccharum, containing a substantial proportion of dextrine with any desired proportion of fermentable sugar, and which will therefore impart a less sweet and also a fuller drinking character to the beer without the necessity of departing from the methods ordinarily practised of mashing the malt 5 and boiling the wort. The dextrine-dextrose and the invert sugar of which the said dextrine-dextro-lævulose is composed are either blended together in the process of brewing, or, as I prefer, blended at any stage of their manufacture after neutralization, so as to constitute a merchantable article, the manufacture of which forms part of my Invention. 10

I conduct the manufacture of the dextrine-dextro-lævulose in two separate processes. First, I convert amylaceous substances (preferably rice) in the manner herein-after explained, whereby I obtain as much dextrine as possible. I then invert cane sugar, using acid in both cases, and after neutralizing each I blend the two together in the required proportions at any subsequent stage of the manufacture, 15 or in the process of brewing, as already mentioned.

For converting the rice I at first employ heat and acid in the usual way, but afterwards maintain the heat so long only as any traces of starch remain, and I neutralize the solution when two equivalents of dextrine and one equivalent of sugar are formed, so as to produce as nearly as practicable a solution containing 20 67 per cent. of dextrine and 33 per cent. of sugar, calculated upon the dry extract. In inverting the cane sugar the well known method by the aid of dilute sulphuric acid is adopted.

I am aware that it has been proposed to manufacture and employ in brewing as a substitute for malt a substance called "dextrine-maltose," which is said to be 25 composed of about 33 per cent. of ordinary dextrine and 67 per cent. of maltose (containing a further quantity of dextrine soluble in alcohol), being a compound body supposed to possess the same constituents as obtained from malt by an ordinary mashing process; but the substance which I employ differs essentially from the so-called dextrine-maltose, and the processes I adopt are quite distinct. The 30 dextrine-maltose is obtained by carrying the conversion far beyond the point at which I stop to avoid any further transformation of dextrine into glucose, and I supply the required extra amount of fermentable sugar by a separately prepared invert sugar, as herein-before explained.

I vary the proportions of inert sugar to suit the brewing of different kinds of 35 beer, preferring to use a sufficient quantity of the dextrine-dextrose to give at least 10 per cent. of dextrine.

In some cases, more particularly for low quality beers and porter, instead of manufacturing dextrine-dextro-lævulose, as herein-before described, I use dextrine prepared by torrefaction in the usual way, taking care that it is quite free from 40 starch, and I employ it in combination with a suitable proportion of invert sugar, the two being blended together in the course of manufacture or in the process of brewing.

Although I have described my Invention specially as regards beers it also applies to brewing other fermentable liquors, wines for example. 45

SPECIFICATION in pursuance of the conditions of the Letters Patent filed by the said William Garton in the Great Seal Patent Office on the 27th September 1876.

WILLIAM GARTON, of the Town and County of Southampton, Brewer. "IMPROVEMENTS IN BREWING, AND THE PREPARATION OF A MATERIAL TO BE EMPLOYED 50 THEREIN."

It has been usual for some time past to employ as a substitute for a portion of the malt used in the brewing of beer a prepared sugar known in the trade as saccharum.

Garton's Improvements in Brewing.

This saccharum is chiefly manufactured from cane sugar by the well known processes of inverting with an acid at certain temperatures; but in consequence of its highly vinous and fermentable character, and the absence of dextrine, the malt used in conjunction with it has to be manipulated in such a way as to retain a larger proportion of dextrine than is usually left by the ordinary methods of brewing, and difficulties arise in effecting this result in some breweries, and the beer produced has in some cases too sweet a flavor, and in others it attenuates too freely.

The article is also manufactured partly from amylaceous substances and partly from cane sugar by a combined process, that is, acid is employed to convert the starch to dextrine-dextrose, when the temperature is reduced and cane sugar added to the acid solution, and as it is necessary to defer the neutralization for several hours to insure a proper inversion of the cane sugar, a further conversion of the rice product takes place and the dextrine cannot be kept intact, consequently this combined process only supplies an inappreciable amount of dextrine to the dextrose and invert sugar produced; therefore almost the same results as those above named are caused.

Sometimes ordinary glucose is mixed with invert sugar in brewing, but owing to the small quantity of dextrine it contains the objection before referred to is not overcome, and although the mixture gives a heavier final gravity to the beer, this is due to the presence of inert bodies, which impart an undesirable bitter flavor.

Now my Invention consists in the employment in brewing of what I term dextrine-dextro-levulose, or dextro-saccharum, containing a substantial proportion of dextrine with any desired proportion of fermentable sugar, and which will therefore impart a less sweet and also a fuller drinking character to the beer without the necessity of departing from the methods ordinarily practised of mashing the malt and boiling the wort. The dextrine-dextrose and the invert sugar of which the said dextrine-dextro-levulose is composed are either blended together in the process of brewing, or, as I prefer, blended at any stage of their manufacture after neutralization, so as to constitute a merchantable article, the manufacture of which forms part of my Invention.

I conduct the manufacture of the dextrine-dextro-levulose in two separate processes. First, I convert amylaceous substances (preferably rice) in the manner herein-after explained, whereby I obtain as much dextrine as possible. I then invert cane sugar, using acid in both cases, and after neutralizing each I blend the two together in the required proportions at any subsequent stage of the manufacture, or in the process of brewing, as already mentioned.

For converting the rice I at first employ heat and acid in the usual way, but afterwards maintain the heat so long only as any traces of starch remain, and I neutralize the solution when two equivalents of dextrine to one equivalent of sugar are formed, so as to produce as nearly as practicable a solution containing 67 per cent. of dextrine and 33 per cent. of sugar, calculated upon the dry extract. In inverting the cane sugar the well-known method by the aid of dilute sulphuric acid is adopted.

I am aware that it has been proposed to manufacture and employ in brewing as a substitute for malt a substance called "dextrine-maltose," which is said to be composed of about 33 per cent. of ordinary dextrine and 67 per cent. of maltose, being a compound body supposed to possess the same constituents as obtained from malt by an ordinary mashing process; but the substance which I employ differs essentially from the so-called dextrine-maltose, and the processes I adopt are quite distinct. The dextrine-maltose is obtained by carrying the conversion far beyond the point at which I stop to avoid any further transformation of dextrine into sugar, and I supply the required or extra amount of fermentable sugar by a separately prepared invert sugar, as herein-before explained.

I vary the proportions of invert sugar to suit the brewing of different kinds of

Garton's Improvements in Brewing.

beer, preferring to use a sufficient quantity of the dextrine-dextrose to give at least 10 per cent. of dextrine.

In some cases, more particularly for low quality beers and porter, instead of manufacturing dextrine-dextro-lævulose, as herein-before described, I use dextrine prepared by torrefaction in the usual way, taking care that it is quite free from starch, and I employ it in combination with a suitable proportion of invert sugar, the two being blended together in the course of manufacture or in the process of brewing. 5

Although I have described my Invention specially as regards beers it also applies to brewing other fermentable liquors, wines for example. 10

In witness whereof, I, the said William Garton, have hereunto set my hand and seal, this Twenty-fifth day of September, One thousand eight hundred and seventy-six.

WILLIAM GARTON. (L.S.)

LONDON: Printed by GEORGE EDWARD EYRE and WILLIAM SPOTTISWOODE,
Printers to the Queen's most Excellent Majesty. 1876.